BC Hydro
Power smart

NETWORK ECONOMY ANNUAL REPORT TO TRANSMISSION CUSTOMERS

April 2016

Introduction

Pursuant to British Columbia Utilities Commission (the "Commission") Order No. G-127-06, Appendix 1 (Appendix 1), BC Hydro is to convene an annual Network Economy Meeting to discuss, on a "without prejudice" basis, issues arising with respect to the use of Network Economy. The first annual meeting was to take place one year after implementation of the revised Network Economy provisions and no later than June 1, 2008. No issue with respect to the use of Network Economy had arisen and, with approval of the Commission, the meeting was not held.

In 2009, in BC Hydro's consultation on the requirement of the Network Economy annual meeting a customer proposed that a meeting may not be necessary if BC Hydro prepared an annual Network Economy report showing trends and statistics along with explanations for the figures. This proposal was subsequently approved by the Commission via Letter No. L-32-09 (Appendix 2).

In 2010, again there was no interest by customers to hold a Network Economy annual meeting so BC Hydro requested permission from the Commission to not hold a 2010 Network Economy meeting. The Commission, via Letter No. L-45-10 (Appendix 3), approved BC Hydro's request and furthermore stated that BC Hydro is only expected to convene an annual Network Economy meeting if customers of BC Hydro expressly ask for a meeting by way of a letter to BC Hydro and copied to the Commission. Additionally, the Commission requested BC Hydro to continue its postings of future annual Network Economy meeting bulletins and future Annual Reports.

On April 8, 2016, BC Hydro posted a bulletin (Appendix 4) attaching its annual Network Economy Report and asked customers to decide if, after reviewing the report, an annual Network Economy meeting is required. If customers felt a meeting was required it was requested that they submit their letter in accordance with Commission Letter Order L-45-10 by April 25, 2016.

Purpose

Network Economy is also known as Secondary Service under the OATT (Appendix 5). The terms and conditions for Network Economy are described in Sections 28.4 and 28.6, Attachment Q-2, the Settlement Agreement (Appendix 1, page 2 of 20 onwards), and Tariff Supplement No. 80 (Appendix 6).

There are two components that determine the priority of Network Economy Transmission Service: the Network Economy Utilization Test and the Economic Test. The procedures for calculating the Network Economy Utilization Test, and the market and trigger price determinations for calculating

the Economic Test are set out in BC Hydro Business Practice (Appendix 7) entitled Network Economy Service.

This report details the history of the use of Network Economy for the last three years until BC Hydro's recent fiscal year end (March 24, 2013 to March 26, 2016). The statistics that follow provide information on volume, the utilization rate, the frequency of times that the Network Customer passed the Economic Test and the relationship between volume and price.

Specifically, for the Utilization Test:

- Graphs 1 and 2 show the Network Economy transmission volume (MWh) that was reserved.
- Graphs 3 and 4 show the Utilization Rate.

For the Economic Test:

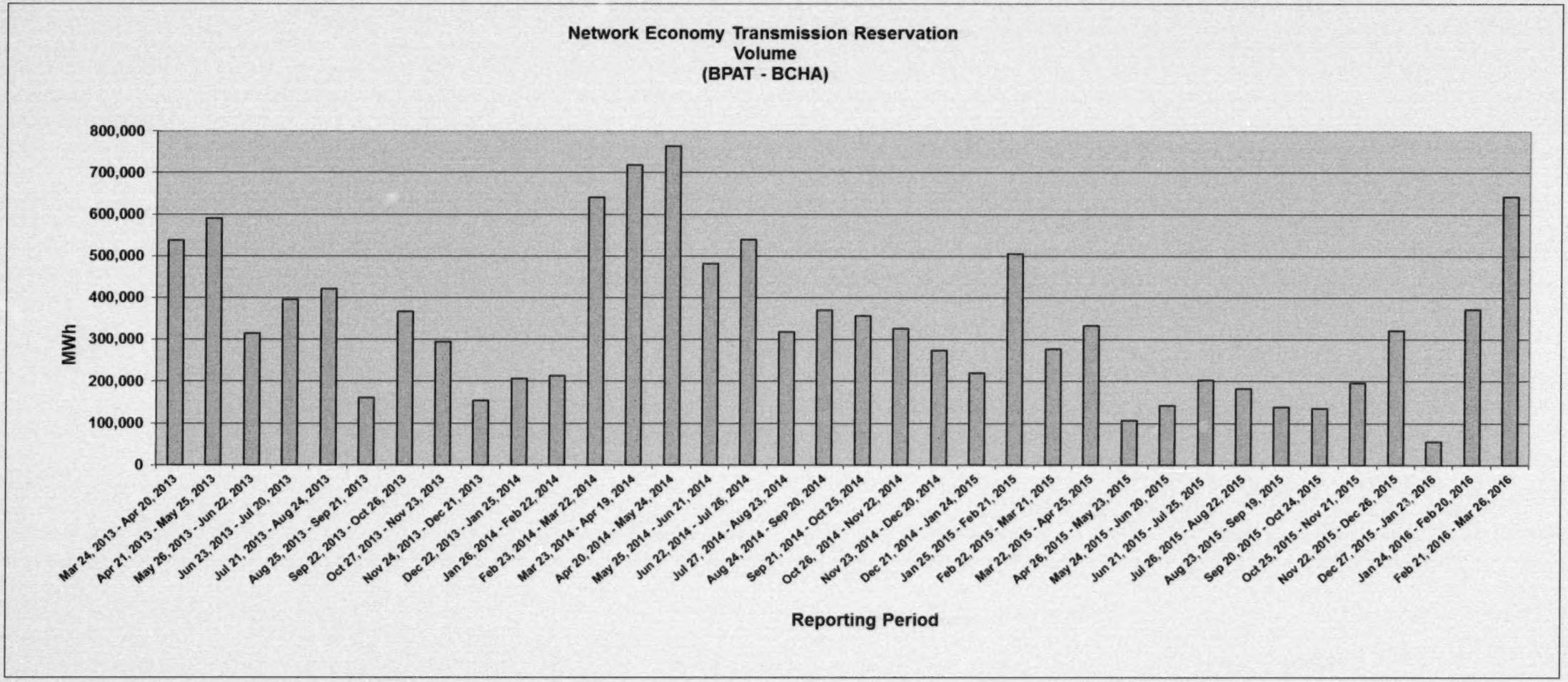
- Table 1 summarizes the Economic Test results.
- Table 2 provides a summary of the average Market Price for the US-BC and AB-BC interties.
- Graphs 5 and 6 illustrate the relationship between the Network Economy transmission volume and the average Market Price.

BC Hydro
Power smart

Utilization Test

Results are shown in Graphs 1-4.

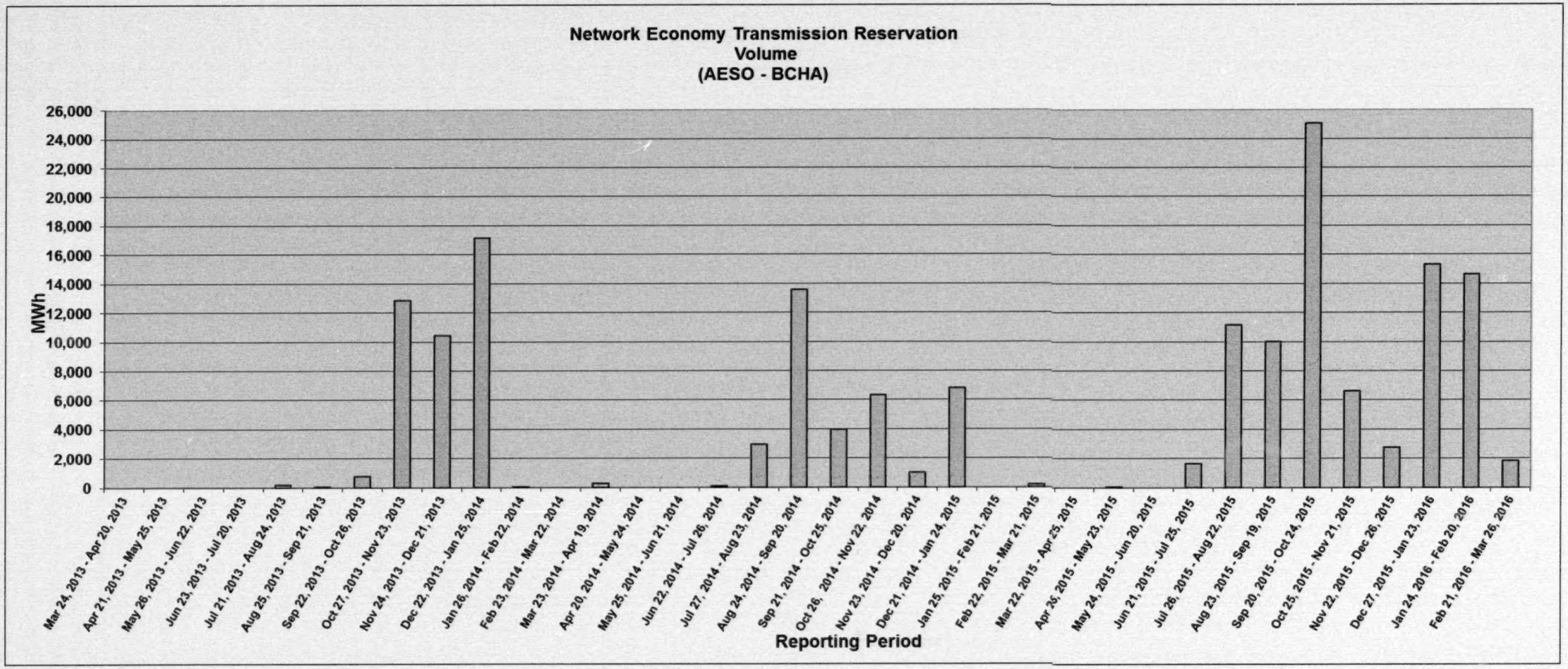
Graph 1: The graph below shows the Network Economy transmission volume (MWh) that was reserved by the Network Customer from March 24, 2013 to March 26, 2016 on the BPAT-BCHA import path.



This graph shows that the highest amount of Network Economy transmission reserved for import on the BPAT – BCHA path was 763,622 MWh for the period April 20, 2014 to May 24, 2014 followed by 717,902 MWh for the period of March 23, 2014 to April 19, 2014, and 643,154 MWh for period February 21, 2016 to March 26, 2016. Import transmission reservations for all other time periods from March 24, 2013 to March 26, 2016 are essentially below 640,000 MWh.

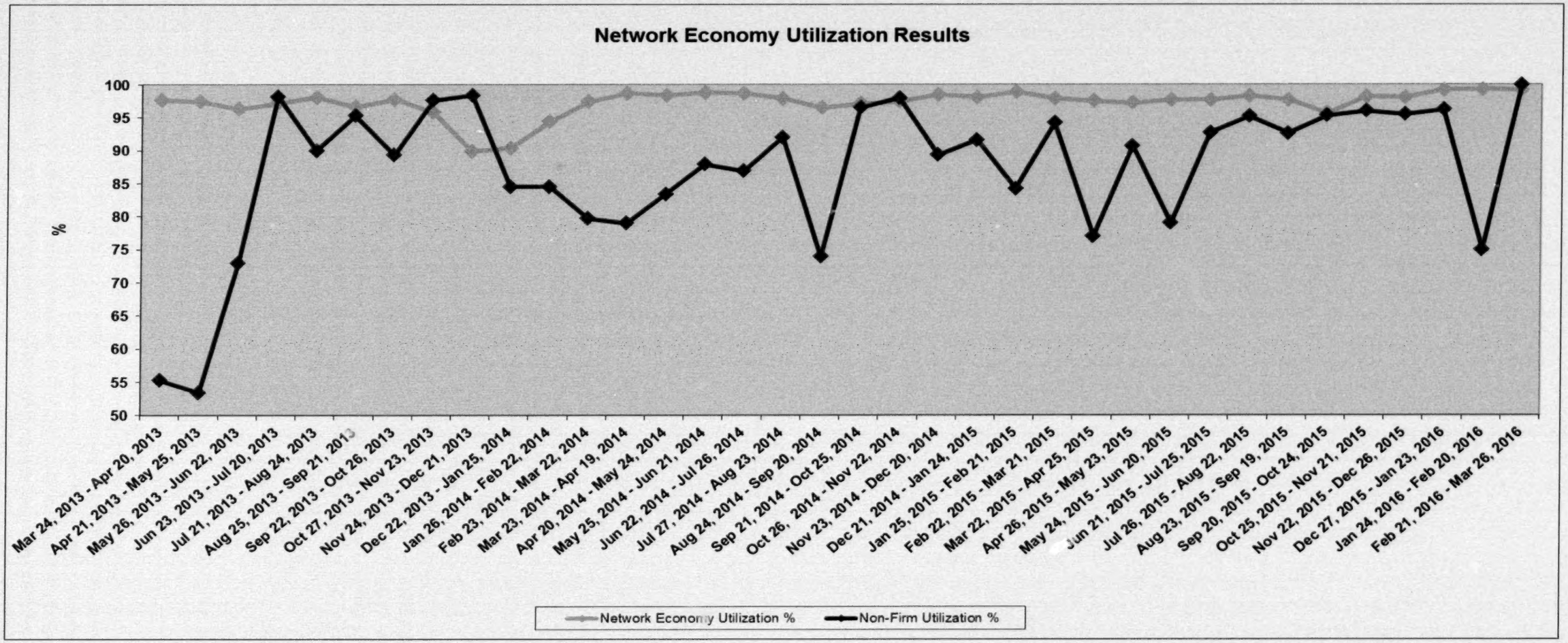
BC Hydro
Power smart

Graph 2: The graph below illustrates the Network Economy transmission volume (MWh) that was reserved by the Network Customer from March 24, 2013 to March 26, 2016 on the AESO - BCHA import path.



This graph shows that the highest amount of Network Economy transmission reserved for import on the AESO – BCHA path was 25,075 MWh for the period September 20, 2015 to October 24, 2015 followed by 17,151 MWh for the period December 22, 2013 to January 25, 2014, and 15,321 MWh for the period December 27, 2015 to January 23, 2016. For the reporting periods from March 24, 2013 to March 26, 2016 there are 18 periods with reserved volume above 1,000 MWh, and all other periods are below 1,000 MWh. (Refer to Item 5 (in Appendix 1 to Order No. G-127-06, Page 11 of 20), in Appendix 1 for the definition of the Reporting Period).

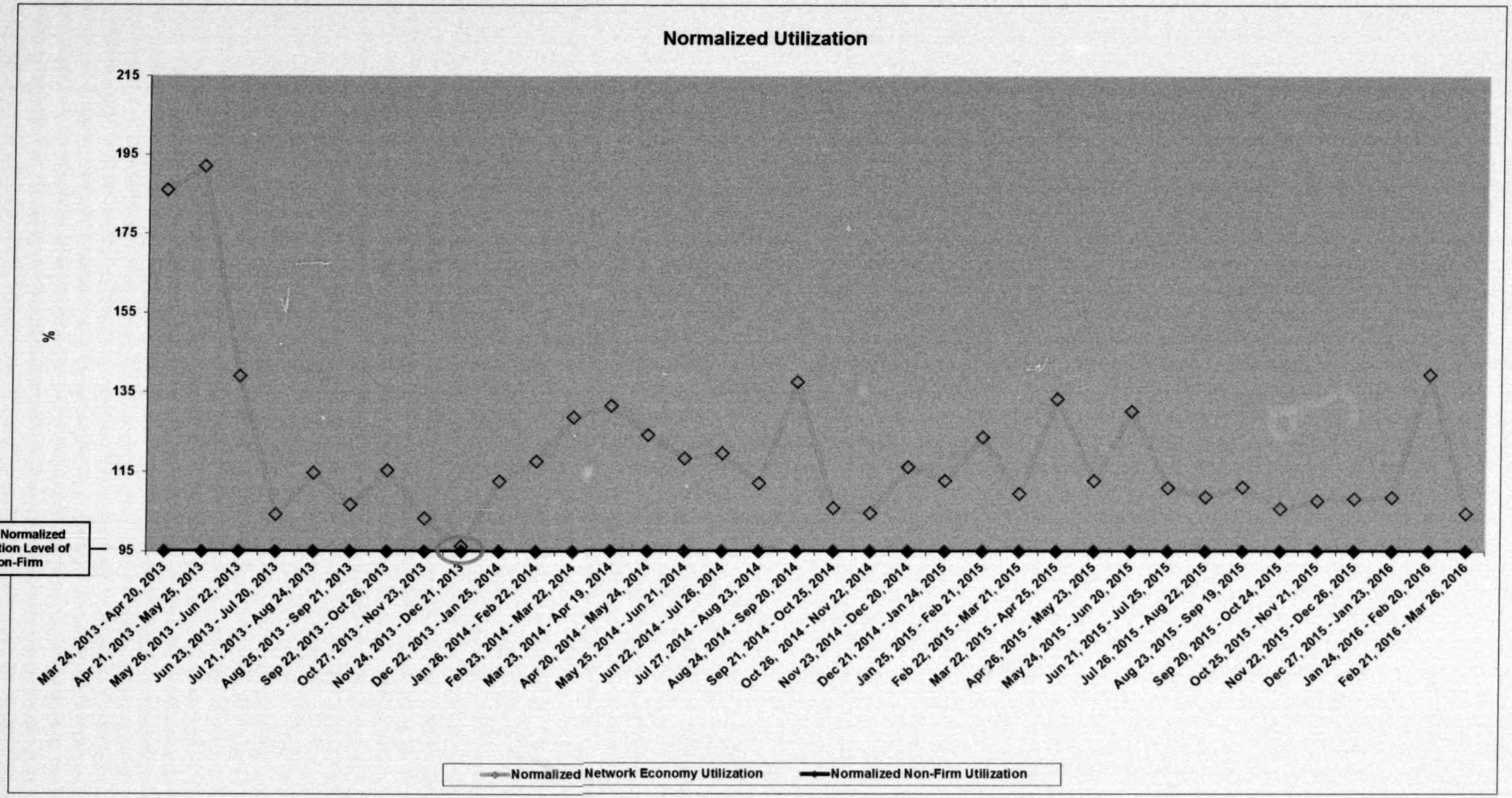
Graph 3: The graph below shows the Utilization Rate.



In accordance with Attachment Q-2, Section 5 of the BC Hydro Open Access Transmission Tariff (OATT), "The Network Customer must, for the entirety of the reporting period,... maintain an average utilization rate of all Network Economy reservations of at least 95% of the average utilization of Daily and Hourly Non-Firm Point-to-Point service by customers, other than the Network Customer or its marketing affiliates, in pre-schedule and Real-Time, over the same reporting period." BC Hydro calculates the average utilization rate of Network Economy Transmission reservations by the Network Customer and the Non-Firm Point-to-Point (PTP) Transmission reservations by non-Network Customers. The Network Customer passes the Utilization Test if the average utilization rate of the Network Economy transmission reservations divided by the average utilization rate of the Non-Firm PTP transmission reservations of non-Network Customers is greater than or equal to 95%. Data indicates that the Network Customer failed the Utilization Test one time: November 24, 2013 – December 21, 2013 (refer to Appendix 8). Please refer to the Network Economy Business Practice for details regarding the process and calculations used in determining the Utilization Test.

BC Hydro
Power smart

Graph 4: The normalized graph below also shows that Network Economy utilization during the reporting period has been at least 95% of the average utilization of Daily and Hourly Non-Firm PTP Transmission service by customers to maintain priority. (Refer to Attachment Q-2 for details). The red circle indicates when the Network Customer failed the Utilization Test: November 24, 2013 – December 21, 2013.



BC Hydro
Power smart

Economic Test

The Economic Test uses both the Market Price and the Trigger Price for both the Alberta-BC and the US-BC interties. (Refer to Appendix 7, Network Economy Service Business Practice, for definitions of these prices).

Network Economy transmission reservations will have the priority and rights provided in Section 14.7 of the OATT only if the Market Price is less than or equal to the Trigger Price for the delivery hour ("PASS"). If the Market Price is greater than the Trigger Price for the delivery hour ("FAIL"), Network Economy transmission reservations will have the same priority as Non-Firm PTP transmission service, with the exception that the provisions of Section 14.2 of the OATT providing for reservation priority based on price shall not apply.

Table 1: The table below summarizes the Economic Test results for the time periods as indicated, which are performed on a daily basis.

	BPAT - BCHA		AESO - BCHA	
MONTH	PASS	FAIL	PASS	FAIL
April-13	0%	100%	0%	100%
May-13	0%	100%	0%	100%
June-13	0%	100%	0%	100%
July-13	0%	100%	0%	100%
August-13	0%	100%	0%	100%
September-13	0%	100%	0%	100%
October-13	0%	100%	0%	100%
November-13	42%	58%	42%	58%
December-13	58%	42%	0%	100%
January-14	80%	20%	0%	100%
February-14	71%	29%	0%	100%
March-14	0%	100%	0%	100%
April-14	0%	100%	0%	100%
May-14	0%	100%	0%	100%
June-14	0%	100%	0%	100%
July-14	0%	100%	0%	100%
August-14	0%	100%	0%	100%
September-14	0%	100%	0%	100%
October-14	0%	100%	0%	100%

BC Hydro
Power smart

	BPAT - BCHA		AESO - BCHA	
MONTH	PASS	FAIL	PASS	FAIL
November-14	90%	10%	0%	100%
December-14	87%	13%	0%	100%
January-15	98%	2%	0%	100%
February-15	92%	8%	0%	100%
March-15	0%	100%	0%	100%
April-15	0%	100%	0%	100%
May-15	0%	100%	0%	100%
June-15	0%	100%	0%	100%
July-15	0%	100%	0%	100%
August-15	0%	100%	0%	100%
September-15	0%	100%	0%	100%
October-15	0%	100%	0%	100%
November-15	49%	51%	0%	100%
December-15	54%	46%	0%	100%
January-16	33%	67%	0%	100%
February-16	48%	52%	0%	100%
March-16	0%	100%	0%	100%

Table 2: The table below provides the average Market Price for the US-BC and AB-BC interties for the time periods as indicated.

MONTH	AVERAGE MARKET PRICE[1] ($ / MWh)	
	US-BC	AB-BC
April-13	$26.50	$134.78
May-13	$23.50	$130.34
June-13	$29.53	$104.97
July-13	$37.23	$56.20
August-13	$36.16	$82.84
September-13	$36.07	$97.83
October-13	$37.02	$64.88
November-13	$37.12	$28.16
December-13	$55.82	$52.31
January-14	$45.06	$45.03
February-14	$78.84	$97.74
March-14	$29.55	$44.41
April-14	$28.65	$30.59
May-14	$21.84	$54.27
June-14	$24.89	$41.95
July-14	$35.82	$121.78
August-14	$42.54	$46.16
September-14	$42.12	$23.87
October-14	$36.87	$27.07
November-14	$37.33	$37.63
December-14	$33.59	$27.01
January-15	$27.31	$33.85
February-15	$19.80	$31.62
March-15	$22.24	$21.83
April-15	$24.27	$20.59
May-15	$31.93	$53.82
June-15	$40.24	$96.30

[1] Calculated as per BC Hydro Network Economy Business Practice

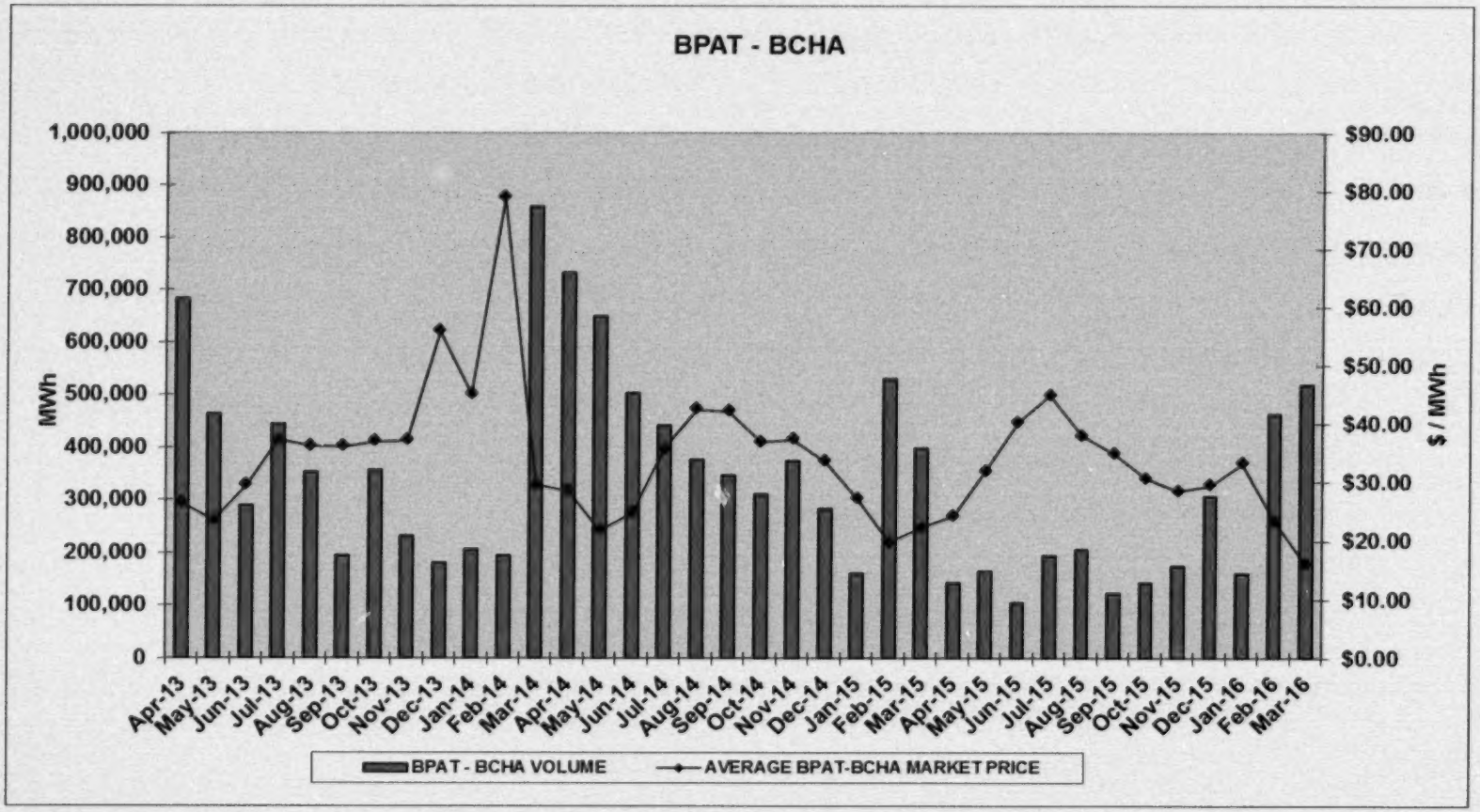
BC Hydro
Power smart

MONTH	AVERAGE MARKET PRICE[2] ($ / MWh)	
	US-BC	AB-BC
July-15	$44.92	$24.08
August-15	$37.96	$34.20
September-15	$34.97	$20.83
October-15	$30.66	$21.53
November-15	$28.54	$21.10
December-15	$29.51	$20.85
January-16	$33.25	$22.17
February-16	$23.32	$17.28
March-16	$15.94	$14.80

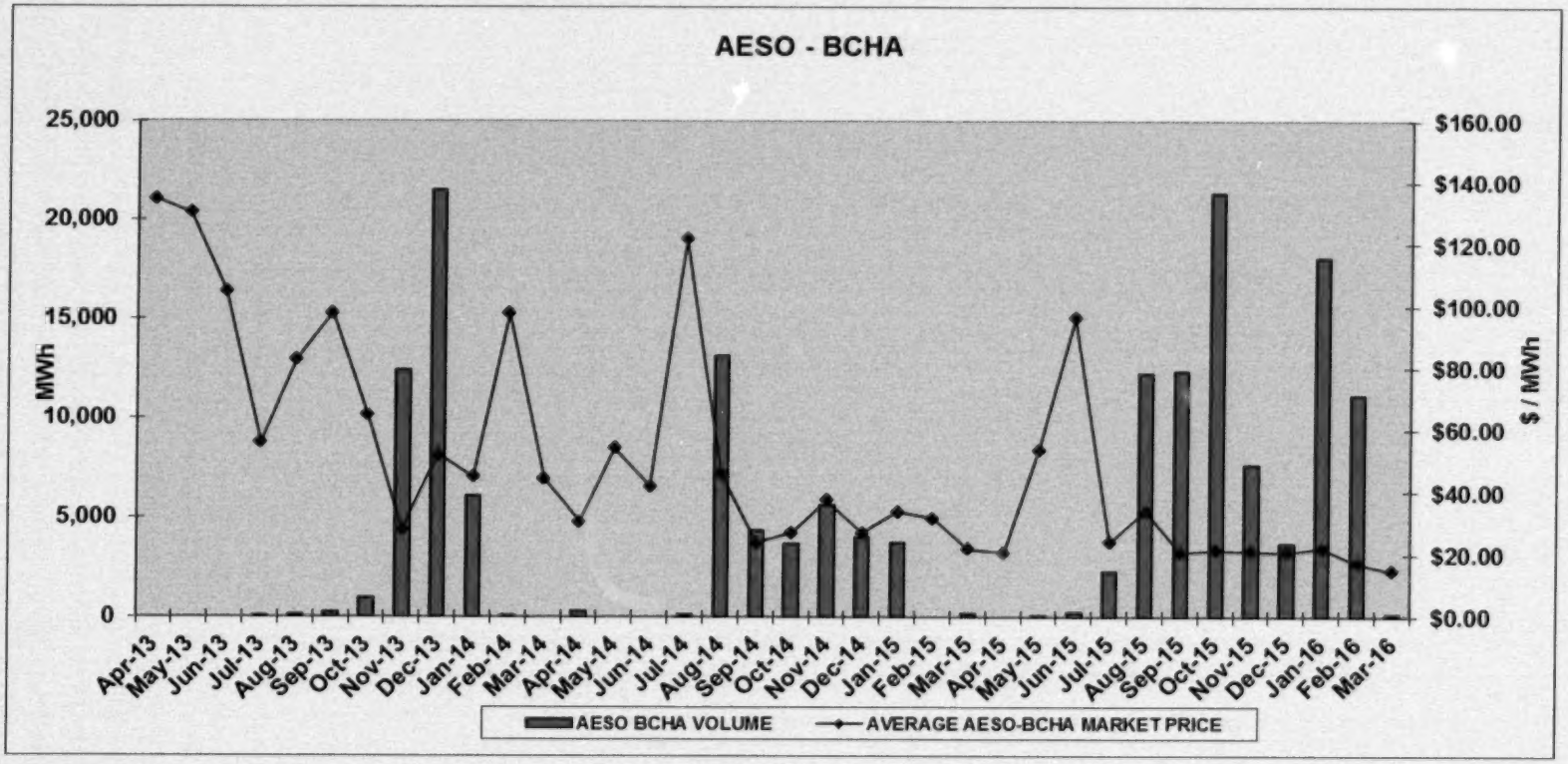
[2] Calculated as per BC Hydro Network Economy Business Practice

BC Hydro
Power smart

Graph 5: This graph illustrates the relationship between the Network Economy transmission volume and the average Market Price per month from April 2013 to March 2016 for the BPAT–BCHA path.



Graph 6: This graph illustrates the relationship between the Network Economy transmission volume and the average Market Price per month from **April 2013 to March 2016** for the AESO–BCHA path.



List of Appendices

Appendix 1: British Columbia Utilities Commission Order No. G-127-06
http://www.bcuc.com/Documents/Orders/2006/DOC_12919_G-127-06_BCTC-NEOATT-Settlement-Agreement.pdf

Appendix 2: British Columbia Utilities Commission Letter No. L-32-09
http://www.bcuc.com/Documents/Orders/2009/DOC_21916_L-32-09_2009%20Network%20Economy%20Mtg%20Cancelled.pdf

Appendix 3: British Columbia Utilities Commission Letter No. L-45-10
http://www.bcuc.com/Documents/Orders/2010/DOC_25642_L-45-10_BCTC-2010-Network-Economy-Meeting.pdf

Appendix 4: April 8, 2016 BC Hydro Bulletin https://www.bchydro.com/energy-in-bc/our_system/transmission/transmission-scheduling/bulletins/2016.html

Appendix 5: OATT
https://www.bchydro.com/about/planning_regulatory/tariff_filings/oatt.html

Appendix 6: Tariff Supplement No. 80
https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/tariff-filings/open-access-transmission-tariff/tariff-supplement-80.pdf

Appendix 7: Network Economy Service Business Practice
https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/suppliers/transmission-scheduling/business_practices/Network%20Economy%20-%20April%201%2C%202016.pdf

Appendix 8: Monthly Network Economy Utilization Results
https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/suppliers/transmission-scheduling/transaction_data/Network%20Economy/network_economy_utilization/2016/Monthly%20Network%20Economy%20-April%202016.pdf